

# Marsupialization as optional treatment protocol for odontogenic keratocyst with three years follow up

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## ABSTRACT

**Purpose:** This study was conducted to estimate the effectiveness of marsupialization as definitive treatment in odontogenic keratocyst "OKC".

**Methods:** we managed 12 patients (8 male and 4 female )between the age 16-45 years old (mean 30.5 years old ).Biopsy and needle aspiration were used to confirm odontogenic keratocyst diagnosis. The cyst size was measured by digital orthopantomography and the size range was between 2.5-9 cm. The treatment involved marsupialization followed by another marsupialization for the recurrent cases. The patients were followed up for about 36 months with 4-6-month intervals between the follow up visits .

**Result:** The healing or reduced "OKC" size was evaluated clinically and radiographically .The odontogenic keratocyst resolved completely in 11 patients, and the cyst walls shrank in 1 patient. The latter patient required a second operation to remove the associated impacted teeth after that any case of recurrence was not seen during the entire 3years follow-up period.

**Conclusion:** Marsupialization was an effective ,less aggressive, less post-operative complication in addition to less surgery time. It required a co-operative patient who will irrigate the cavity and keep it open. Biopsy displayed that the cyst lining was replaced by normal epithelium during follow up period.

**"Key words :Marsupialization, odontogenic keratocyst, mandibular jaw"**

## HOW TO CITE THIS ARTICLE

Dr. Thaer Hameed Mohsin, Dr. Hani M. Khlaif, "Marsupialization as optional treatment protocol for odontogenic keratocyst with three years follow up", International Journal of Enhanced Research in Science, Technology & Engineering, ISSN: 2319-7463, Vol. 7 Issue 5, May -2018.

## INTRODUCTION

The keratocyst, is one of the developmental odontogenic cyst,is derived from cell rests of the dental lamina or its remnant. It occurs mostly in the posterior body and vertical ramus of the mandible and may also be seen in the anterior mandible or any part of the maxilla. It has specific feature in its clinical and histopathological behavior and high recurrence rate, therefore it was suggested that the keratocyst represented as a benign cystic neoplasm and its treatment showed high controversy<sup>[1]</sup>. It is considered radiographically as a well-defined benign unilocular radiolucence (unicystic) and the large one may appear multilocular radiolucence (multicystic) lesion with smooth margin may or may not be associated with a tooth and the lesion have tendency to invade adjacent tissue<sup>[2]</sup>.It has been evaluated that about 5%-9% of keratocysts occur in between 8-10 years old, but it found mostly in between 20 -40 years old (54.2%)<sup>[3]</sup>. Patients may present with swelling, pain and discharge or may be asymptomatic, Distinctive clinical features include a potential for local destruction and a tendency for multiple appearance in the jaw. Odontogenic keratocyst, "OKC" have well-known tendency to recur and because of this property, enucleation has been recommended. However, there is no experimental proof to refuse marsupialization as optional protocol treatment<sup>[4]</sup>, The Marsupialization means

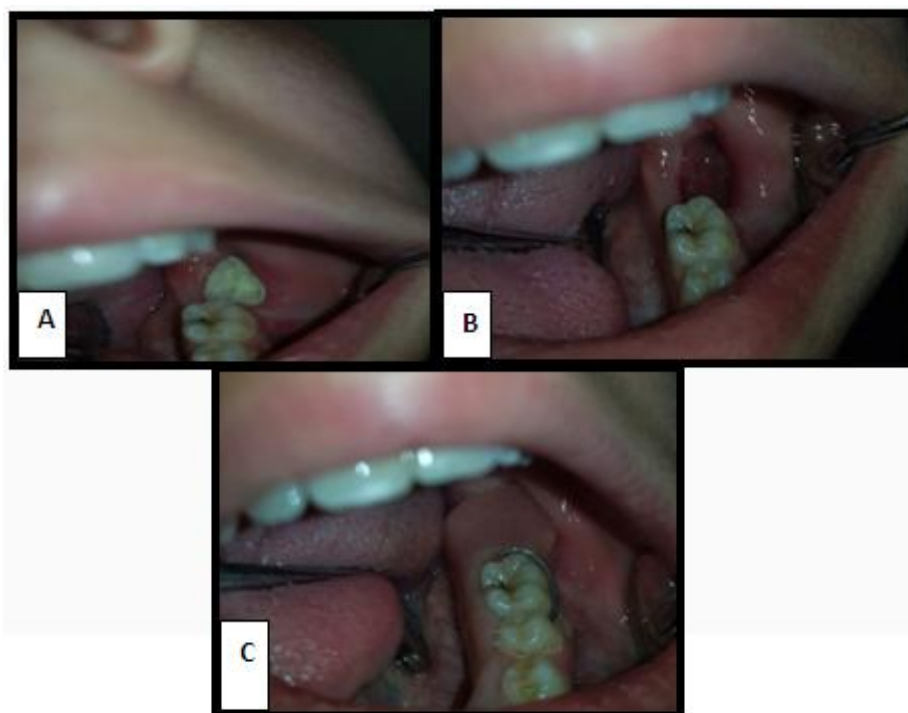
creation window into the cyst and decompression the cystic effect. Marsupialization of cysts is probably the earliest promoted treatment and was first suggested by partsch I in the German literature in the late 19 centuries. This method was put forward as the treatment of choice, because without antibiotic any attempt at enucleation and primary closure of cyst was accompanied by very high post-operative infection rate<sup>[5]</sup> so enucleation of large jaw cyst with facial deformity may lead to injury to the adjacent neurovascular bundles or jaw fractures. Limitations of this technique are not explained completely<sup>[6]</sup>. So in this study we estimate the marsupialization as an effective method for treatment of "OKCs" with 3 years follow up.

#### Patient and methods:

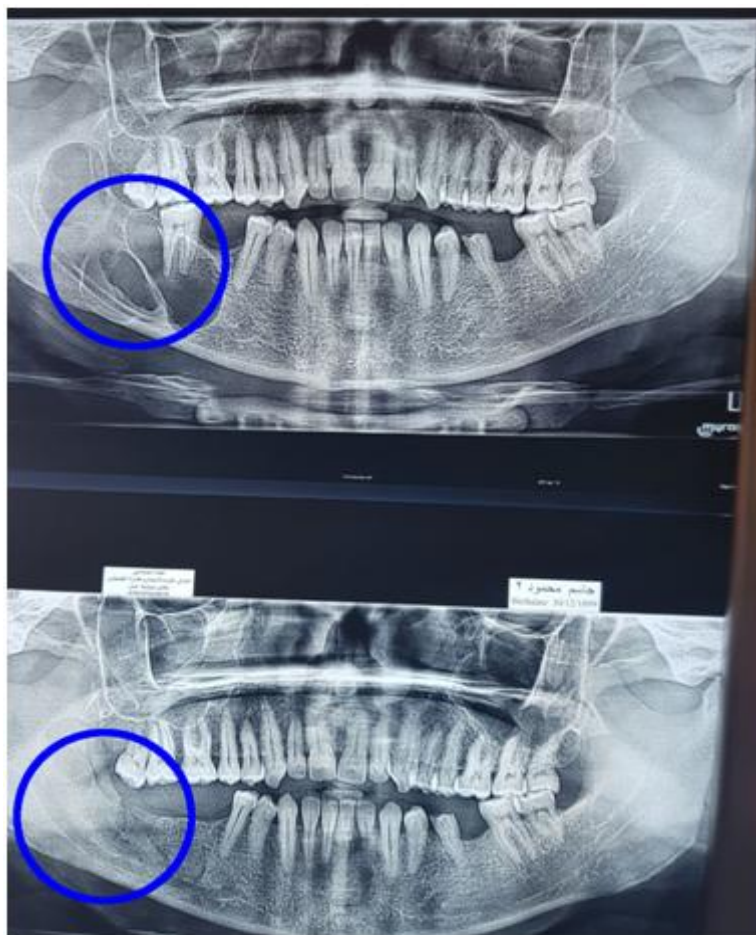
Twelve patients (Eight males 66.6% and four females 33.3%)(Table 1)with suspected "OKCs" aged between 16-45years means age (30.5years old). The diagnosis was ascertained after local cystic aspiration with biopsy. After taking fundamental approvals for operations from the patients and the health establishment, we treated all cases by marsupialization and the operations were done in Alkindy teaching hospital in Baghdad city and Alzhra teaching hospital in addition to our private maxillofacial clinic in Wasit city.

Among twelve patients, ten patients were treated under local anesthesia (83.3% ) while the other two patients were treated under general anesthesia(16.6%) (table 1).All the operation done intra orally by excision of the underlying mucosa and creating window in the wall of the cyst. The size of the window depended on the size of the cyst and the amount of the bone destruction over the cystic area but in average between 1.5- 3 cm .In 2 cases with small cysts, the over lying bone buccally was sound and needed to remove by surgical bur with low speed hand-piece and cooling water to expose the cystic wall while other 10 cases, the over lying bone was either resorbed or egg shell appearance which was easily and gently removed to expose the cyst wall without destruction, after that window creating in the cyst wall with sharp blade and or scissor and the cyst wall sutured with the adjacent mucosa all around the window to expose the cyst content to the oral cavity.

The cystic content was removed and gentle irrigation of the cyst from inside with normal saline ,then packed the lumen of the exposed cyst with iodoform gauze (Figure 1). The iodoform pack medication was change every 5-6 days by another pack which was slightly smaller than the previous one to give space for cyst to heal and decrease in its size, the number of the iodoform pack changes was between 3-6 times according to the cyst size until the edge of the wound epithelized (Figure 1-B) and afterwards fabricate acrylic splint (plug) inserted in order to keep wound opening and clean we kept the splint about 3-7 months (Figure1-C) and periodically reduce in the size of the plug to give space for the cystic lumen to heal and reduce in its size. Instruct the patient to irrigate the surgical pouch with normal saline 2-3 times daily specially after each meal. Radio- graphical examination was used periodically to evaluate the healing and decreases in the lumen size (Figure 2). The effect of marsupialization and recurrence data after a follow-up period of at least 3 years were evaluated.



**Figure (1): Patient with unilateral OKC; A: Iodoform dressing placed inside the pouch area; B: Marsupialization window after 3 weeks, C: Acrylic splint closed the marsupialization opening.**



**Figure(2):pre-operative and post-operative orthopantomography of patient with multilocular "OKC ".**

## RESULTS

In all our 12 patients (100%) the lesions were present in the ramus and the angle of the mandible, 2 of them (16.6%) were presented with impacted tooth and one of the patients had bilateral "OKC" in the mandible (Table 1). Eleven patients (83.3%) with OKCs resolved completely clinically and radio graphically in 7–12 months including one case (8.3%) with impacted tooth after marsupialization the involved tooth will up righted itself and erupted. Only one patient (8.3%) recur, which was associated with impacted tooth and need to extract the tooth and do another marsupialization (Table 2). Follow-up continue for 2.5–3 years in 10 patients (83.3%) and 2 patients (16.6%) not completed the 3 years follow up (Table 2).

Histological sample was taken from the pouch area after marsupialization about 6 months showed normal epithelium without cystic remnants, daughter cysts or cystic lining epithelium.

**Table 1: The Numbers and percentages of sex predilection, location and tooth impaction associated with OKC.**

Patient number	Male	Female	Mandible	Maxilla	Unilateral	Bilateral	Impacted tooth
12 100%	8 66.6%	4 33.3%	12 100%	0 0%	11 91.7%	1 8.3%	2 16.6%

**Table 2: The numbers and percentages of procedures done under Local and general anesthesia with recurrence rate .**

Patient number	Under L.A	Under G.A	Recurrence	With 3 years follow up	With less than 3 years follow up
12 100%	10 83.3%	2 16.6%	1 8.3%	10 83.	2 16.6%

## DISCUSSION

Odontogenic keratocyst is designated by World Health organization (WHO) as keratocystic odontogenic tumor and is defined as benign unicystic or multicystic intraosseous tumor of odontogenic origin, aggressive in nature and lined by parakeratinized stratified squamous epithelium. Odontogenic keratocyst is more commonly seen in males than females, Mandible is more frequently involved than maxilla, 50% of the OKCs occur in mandibular angle region followed by ramus extended to the body. Many studies showed that they occur anywhere in the jaws including midline of mandible and globomaxillary region in the maxilla<sup>[7]</sup>.

The Marsupialization in mandibular cysts means creating a window into the cyst for decompression, this window is opened into oral cavity<sup>[8]</sup>. The marsupialization considered as a conservative surgical approach in the management of large jaw cysts<sup>[9]</sup>. Also it has many beneficial effects like removal or enucleation of the cyst in the mandible and when the cyst is very closed into the Inferior alveolar to avoid damage to the nerve and lost sensibility of the lips after surgery<sup>[10]</sup>. Also the marsupialization is beneficial in big keratocyst in the mandible by prevention of pathologic fracture in weak mandible<sup>[11]</sup>. General anesthesia in old patients or in severely medically compromised patients has high risks hence marsupialization of the "OKC" mostly done under local anesthesia to reduce these risks<sup>[12]</sup>. Marsupialization had been recommended in the treatment of the high recurrent cysts (mainly OKC)<sup>[13]</sup>. Final supposition focused on the fact that marsupialization decreases intracystic negative pressure and may enhance bone formation around jaw cysts<sup>[14]</sup>. This study displayed that the marsupialization method is an active and less aggressive technique in the treatment of "OKC", reducing the lesion size by drainage and decompression with low recurrence rate.

## CONCLUSION

All 12 OKCs resolved completely after marsupialization. Tooth within the cyst were found to be upright and erupted. Marsupialization was found to be an effective treatment procedure for "OKCs" without any role in recurrence of "OKCs". In this study we showed that this treatment required educated and co-operative patients in irrigating the cyst regularly to keep the cystic lumen opened in addition to the commitment in their follow-up appointment. In spite of the long term observation and follow-up, the effectiveness of this type of treatment was confirmed.

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